

# ***DENTAL ITEMS OF SIGNIFICANCE 66***

## **Sept 2002**

### **TABLE OF CONTENTS**

#### ***QUESTIONS & ANSWERS***

- 66-01 Some Tips on Tips
- 66-02 Fifth-Generation Bonding Agents: Are They a Thing of the Past?
- 66-03 The Beryllium Blues
- 66-04 A Question about Questions

#### ***WHAT'S NEW?***

CALSET  
Veraviewepocs  
Command Air X-Ray System II (CAXS II)  
INTERACT Infection Control and Safety Training System  
Promax  
Insti-Dam  
IntraFlow Dental Anesthesia System  
Composi-Tight Gold Sectional Matrix Retainer System  
Fuji Lining LC  
Crosspin  
Miris  
Tyrian SPE Self-Priming Etchant  
Venus Color Adaptive Matrix Restorative  
Harvey PV Dry Table Top Steam Sterilizer  
Transport MDS  
Titan E-lectric Motor System

#### ***FROM THE LITERATURE***

*DO ENDODONTICALLY-TREATED TEETH REALLY BENEFIT FROM CROWN PLACEMENT?*  
*TOOTH WHITENING AGENTS: WHAT A PAIN*  
*WHAT GLOVES SHOULD I BUY?*  
*HOW ABOUT THOSE CARIES DISCLOSING PRODUCTS?*

#### ***GENERAL DENTISTRY***

- 66-05 Protemp 3 Garant Temporary Material
- 66-06 PoGo One Step Diamond Micro-Polishers
- 66-07 NRG LED Curing Light
- 66-08 W&H/A-dec Synea TA-96LW & TA-98LW Fiberoptic High-Speed Handpieces Update
- 66-09 Cavitron Select SPS
- 66-10 DELight Dental Laser System
- 66-11 Coltosol

- 66-12 Hawe Adapt Sectional Matrix System
- 66-13 Midmark Concept LR Dental Chair
- 66-14 Midmark Procenter LR Dental Unit
- 66-15 Midmark Concept LR Operatory Light
- 66-16 Demetron LC

***LABORATORY***

- 66-17 Emmevi Aqua Steam Cleaner
- 66-18 Pro Blend Mixer

***INFECTION CONTROL***

- 66-19 DioxiClear
- 66-20 Selective MicroClean

**"Questions & Answers"** is a feature in which we present and answer some of the questions we have recently received from the field. This month we feature questions about the safe use of beryllium alloys and the pros and cons of using disposable air/water syringe tips. Should you want more information about a particular topic, please contact the individual whose name follows the specific answer in which you are interested. If you have a question about a topic not discussed in this issue, feel free to call DIS at DSN 792-7676.

## 66-01 Some Tips on Tips

**Question:** Our clinic is considering changing from metal air/water syringe tips to disposable, plastic ones. Is this a good idea, and what are the advantages and disadvantages of switching?

**Answer:** Properly removing bioburden from dental instruments is a major infection control concern within any dental facility. One study<sup>1</sup> has shown that ultrasonic cleaning does not remove all bioburden from within the lumen of metal three-way syringe tips. Although reusable air/water syringe (AWS) tips meet sterilization standards, accumulation of internal bioburden over time could potentially compromise sterilization procedures. Because of this, many dental treatment facilities are now using disposable AWS tips. Compared to metal syringe tips, disposable AWS tips are easier to use, more convenient, and enhance infection control. However, before switching to them, there are some things you need to be know. First, disposable AWS tips require adaptors so they can be properly retrofitted onto the existing dental units. Unfortunately, adaptors (which are available for an additional charge) are not made for all brands of dental units. Before you buy disposable AWS tips, ask the manufacturer if he provides adaptors for the brand(s) of units you have. You should also know that some brands of AWS tips lack the ability to swivel, which can make them inconvenient to use because you can't easily rotate them to gain access to certain areas of the mouth. An important limitation of currently-available disposable AWS tips is that none is adequately radiopaque. Although this may seem to be a minor deficiency, reports do exist of patients who have inadvertently ingested AWS tips, as we have noted on our web site. If the tips are not radiopaque, it would make it very difficult (if not impossible) to locate the tip radiographically for retrieval. Lastly, be aware that the costs of using disposable AWS tips can be significant compared to metal syringe tips. Cost comparisons done by DIS indicate that, on an annual basis, using disposable tips can cost up to seven times more than using resterilizable metal ones. Added to the cost would be the additional fee that many manufacturers charge for the dental unit adaptors, which can range from approximately \$6.20 to \$15.50 for each dental unit.

It is important to consider these issues prior to switching to disposable tips. As always, the convenience and infection control benefits must be weighed against the real concerns of an additional cost.  
(TSgt Sutter)

### Reference

1. Puttiah R, Cottone JA, Guildersleeve J, Azmoudeh A, Tenney J. Rationale for using single-use disposable air/water syringe tips. *Compend Contin Educ Dent* 1999;20:1056-1058, 1060, 1063-1064.

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## 66-02 Fifth-Generation Bonding Agents: Are They a Thing of the Past?

**Question:** I see a lot of ads for bonding agents that don't need to be used with phosphoric acid. Is this the latest thing in bonding?

**Answer:** Dentin bonding agents (DBAs) that don't require a separate phosphoric etchant acid are called self-etching primer products. They bond to dentin and cut (i.e., prepared) enamel by etching the tooth with an acid that is already in the bonding agent. In other words, no separate phosphoric acid etching is necessary with them. Self-etching primer DBAs come as either two bottles (a self-etching primer, followed by a separate adhesive) or one (etchant, primer, and adhesive all-in-one). Examples of each type are given in the Table below.

Two-Bottle Products	One-Bottle Products
Clearfil SE Bond (Kuraray) Clearfil Liner Bond 2V (Kuraray)	Prompt L-Pop (3M ESPE) One-Up Bond F (Tokuyama/J. Morita) Touch & Bond (Parkell)

Perhaps the most recent development in bonding has been the addition of self-etching primers to the fifth-generation bonding agents. Fifth-generation DBAs, also known as one-bottle or one-component DBAs, have been available since the mid-1990s and include such products as Single Bond (3M ESPE), OptiBond Solo Plus (SDS/Kerr), PQ 1 (Ultradent), Excite (Ivoclar Vivadent). Their manufacturers don't want to be left behind now that self-etching primers have become popular, so they have incorporated these into their product lines. Until very recently, the fifth-generation DBAs consisted of a single bottle or syringe that contained both the primer and the adhesive. The tooth structure needed to be treated with phosphoric acid before they were applied. Now, in response to the latest self-etching primer products, the manufacturers of some of the fifth-generation DBAs are selling them with self-etching primers that are used in place of the phosphoric acid. Why do this? Well, the manufacturers claim that using a self-etching primer reduces post-treatment sensitivity and shortens the clinical procedure. In addition, you no longer have to be concerned about how moist the tooth should be at the time of application. Two examples of fifth-generation DBAs now available with self-etching primers are One-Step Plus with Tyrian SPE from Bisco and OptiBond Solo Plus with Self-Etch Primer from SDS/Kerr. If you One-Step Plus or OptiBond Solo Plus and want to reduce the possibility of post-treatment sensitivity, you may want to consider trying a self-etching primer with it. Please note, though, that not all fifth-generation DBAs come with self-etching primers; the only ones currently available are the SDS/Kerr and Bisco products. By the time this is posted to the web, however, others may have come to the market.

(Col Charlton)

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## 66-03 The Beryllium Blues

**Question:** Recently OSHA published a hazard information bulletin on preventing adverse health effects from exposure to beryllium in dental laboratories. Is this bulletin going to drive any changes in how we perform our duties day to day?

**Answer:** The Occupational Safety and Health Administration (OSHA) bulletin published in April of 2002 has raised some concerns about the use of beryllium in dental laboratories. That bulletin, along with one published in September of 1999, give a good background on the metal and its hazards. Beryllium is an essential ingredient in several nickel and chromium base-metal alloys currently used throughout the USAF. Some of these include Ticonium alloys (Ticonium Co.), Rexillium alloys (PENTRON Laboratory Technologies), and Litecast B (Ivoclar/Williams). OSHA has established criteria for limiting workers to beryllium exposure. OSHA has established the following permissible exposure limits (PELs) for beryllium: 2 microgram s/m<sup>3</sup> time-weighted exposure limit for 8 hours; 5 microgram s/m<sup>3</sup> ceiling limit not to be exceeded for more than 30 minutes at a time; and 25 microgram s/m<sup>3</sup> as a peak exposure never to be exceeded. However, OSHA has recently received information that the 8-hour time-weighted PEL may not be adequate to prevent the occurrence of chronic beryllium disease. Accordingly, the American Conference of Governmental Hygienists (ACGIH) has recently published a Notice of Intended Change for its Threshold Value Limit (TLV) for beryllium that would lower the TLV from the current level of 2 micrograms/m<sup>3</sup> to 0.2 microgram s/m<sup>3</sup> averaged over an 8-hour work shift. When the ACGIH ruling becomes binding, USAF facilities will be required to follow the more stringent threshold. If your laboratory is using beryllium, it would be advisable to have air sampling done by Bioenvironmental Engineering to determine if exposures are below the proposed level of 0.2 microgram s/m<sup>3</sup> time-weighted exposure limit for 8 hours. If levels are higher than this, steps should be taken to minimize the hazard. The OSHA bulletins below have guidance on how to lower exposure levels.

[http://www.osha.gov/dts/hib/hib\\_data/hib20020419.pdf](http://www.osha.gov/dts/hib/hib_data/hib20020419.pdf)

[http://www.osha.gov/dts/hib/hib\\_data/hib19990902.html](http://www.osha.gov/dts/hib/hib_data/hib19990902.html)

## **66-04 A Question about Questions**

**Question:** Is there any way to find out where a specific Question and Answer from a past DIS newsletter can be found? Sometimes I remember a Q&A from one of the newsletters but it's a pain to have to go through each newsletter to find it.

**Answer:** Yes, there is a place. DIS has collected the still relevant Questions and Answers from past issues of the newsletter and InControl, and has them available at the following location:

<http://www.brooks.af.mil/dis/QUESTIONS/questlist.htm>

As you'll see, the questions are organized according to their subject matter area (i.e., equipment, materials, infection control, safety). A miscellaneous category is also available. If you are unable to find the answer you are looking for, please give us a call. We'll track down the information you need.

(Col Charlton)

**"WHAT'S NEW?"** features recently-marketed dental equipment and materials. New and innovative products are marketed each month and DIS is unable to evaluate all of them. This section of the newsletter brings these products to your attention. Because DIS has not had the opportunity to evaluate these products, we cannot confirm manufacturers' claims about them. If you would like additional information about the products or are interested in evaluating them, please contact DIS.

**CALSET** is described by its manufacturer (AdDent) as a thermal-assisted light polymerization device. The small unit heats composite capsules to 130 F which is claimed to increase resin composite flowability, improve monomer conversion, and decrease resin film thickness. AdDent also reports that the increased temperature decreases visible-light-curing time of restorative materials by up to 50 percent and increases the effectiveness of in-office bleaching procedures. CALSET is said to fit all currently-marketed resin composite and tooth bleaching capsules. An optional tray for holding bleaching capsules is available at additional cost. The unit operates at 20 volts AC and is shipped with wall transformers that are available for 100, 120, or 230 volt compatibility. CALSET retails for \$298 (optional bleaching capsule tray, \$65). Currently, the unit is available only through dental retailers and no government price is available. For further information, contact AdDent at (203) 778-0200, (203) 792-2275 FAX, or [www.addent.com](http://www.addent.com).

(Lt Col Roberts)

The **Veraviewepocs** is a digital-capable, direct-current panoramic X-ray unit marketed by J. Morita. It is said to produce contrast-rich images in a short 8.2 seconds while producing only half the radiation produced by other units. The machine is reported to have a unique, computerized auto-focusing system that uses a light sensor to adjust its distance, which maintains proper image layers. In addition, it features a three-parameter auto-exposure system that uses a sensor to detect emitted radiation so the machine can automatically adjust the X-ray tube voltage and current as well as the speed of the film movement. The Veraviewepocs also has an imaging arm that automatically adjusts in two dimensions, to maintain the proper focal trough during exposure. Morita claims that this combination of features produces a consistent, distortion-free image layer with a uniform magnification value of 1.3. A touch-pad membrane with LED indicators and audible signals controls all operations. In addition to the standard panoramic mode, the Veraviewepocs offers other modes including an enlarged panoramic mode (1.7X), pediatric panoramic, sinus panorama, and TMJ capabilities. An optional cephalometric attachment and a digital panoramic sensor will be available in the near future. The unit contains a power-assisted lift mechanism for easy patient positioning and provides access for patients in wheel chairs. The Veraviewepocs configuration options include the standard free-standing base or the optional wall-mount version. The unit weighs 419 pounds and requires a space approximately 7¾" H x 3¼" W x 4" D, and is available in both 120V, 60Hz and 230V, 50/60Hz electrical configurations. The Veraviewepocs is available for \$26,000 (retail price) and \$14,995 (government price) from J. Morita at (800) 752-9728, (949) 581-9600, (949) 465-1095 FAX, or [www.jmoritausa.com](http://www.jmoritausa.com).

(Lt Col Roberts)

The **Command Air X-Ray System II (CAXS II)** is an X-ray unit designed for portable radiography. It is said to provide high-frequency, full-wave-rectified output, and has an electronic timing control. The CAXS II is designed to be compatible with all intraoral imaging modalities, including digital imaging systems. The units specifications are listed below.

- output: 10 mA at 60, 65, and 70 kVDC
- exposure timer: 0.02 to 1.98 seconds, 99 steps
- inverter frequency: 70 kHz
- focal spot 0.8 mm

The CAXS II available in either 110-130 V or 210-230 V, 50/60Hz electrical configurations and comes with a tripod that stores in a vinyl carrying case. The unit also has a leaded scatter shield for safe handheld operation. The CAXS II is 17½" H x 16" W x 17" L, occupies 2¾ ft<sup>3</sup>, and weighs 33 pounds. The system costs \$12,100 and is only available for government sale. Further information can be obtained from Aseptico at (800) 426-5913, (425) 487-3157, (360) 668-8722 FAX, or [www.aseptico.com](http://www.aseptico.com).

(Lt Col Roberts)

The Organization for Safety and Asepsis Procedures (OSAP) now offers the **INTERACT Infection Control and Safety Training System**. The product provides pertinent dental infection control and safety information to assist clinics in educating and training their staff, and complying with Occupational Safety and Health Administration (OSHA) requirements. The program was written and reviewed by several nationally known infection control and public health experts and educators. It is reported to be an all-in-one system that uses a workbook and video program to demonstrate infection control concepts, and it provides practical step-by-step protocols for reducing the risk of disease transmission risk. The product consists of two videotapes, 10-chapter workbook, Manager's Guide, Test Answers, Exposure Control Checklist, Post-Exposure Management materials with protocols, posters, and forms. Some of the topics covered are: occupational exposures, personal protection, instrument reprocessing, product selection, hazard communication, and medical waste disposal. The Academy of General Dentistry and Dental Assisting National Board have approved this program for 10 continuing education hours. The cost of the System is \$250.00 (retail/government) and is available by contacting OSAP at (800) 298-OSAP (6727), (410) 571-0003, (410) 571-0028 FAX, or [www.osap.org](http://www.osap.org).

(Col Bartoloni)

The **Promax** is a digital-capable, microprocessor-controlled, direct-current panoramic X-ray unit marketed by Planmeca USA. The Promax features a **Selectively Compliant Articulated Robot Arm (SCARA)** technology to allow the sensor apparatus to move like a human arm. Its shoulder, elbow, and wrist joints are designed to allow adjustments for precise imaging. The unit's imaging software is said to provide distortion-free images by controlling the SCARA through an adjustable focal trough that automatically adjusts radiation emission using a proprietary Automatic Exposure Control system. For conventional panoramic films, the Promax includes Autoprint, an automatic film marking system that annotates not only pertinent patient information but also inscribes the chosen imaging program and exposure parameters. In product advertising, Planmeca claims that the Promax is a multi-function imaging system: in addition to standard panoramic views, the unit offers other exposure modes including pediatric panoramic, TMJ series, maxillary sinus imaging, cephalometric, and linear tomography. Digital radiography can also be performed using the Dimax2 digital sensor system. The Dimax2 can be used for both panoramic and cephalometric imaging (however individual sensors must be purchased to do this) and it is touted to provide real-time imaging on the computer screen. The digital images are manipulated and archived using Planmeca's Dimaxis DICOM-compliant imaging software. Dimaxis allows image enhancement and manipulation (e.g., zoom, contrast, brightness, rotation). Angles and distances can also be measured. The images can be archived in either TIFF or JPG format and can be hard copied using a laser printer, thermal paper printer, or dry processing film printer. The Promax is a free-standing unit weighing 248 pounds (282 with cephalometric attachment). It requires and requires a space 96 H x 59 W x 64 D, and is available in both 120V, 60Hz and 230V, 50/60Hz electrical configurations. Prices are given below.

Unit	Retail Cost	Gov't Cost
Promax Film-Based Panoramic	\$31,250	\$16,387.04
Promax Film-based with Ceph	\$39,949	\$20,949.32
Promax Digital Panoramic	\$58,164	\$30,500.76

Further options and prices can be obtained by contacting Planmeca USA at (630) 953-2368, (630) 953-2405 FAX, or [www.planmecausa.com](http://www.planmecausa.com)

(Lt Col Roberts)

**Insti-Dam** is a pre-mounted latex rubber dam on a plastic frame for isolating operative sites. The manufacturer, Zinc, claims the dam provides excellent visibility and tear resistant. It comes mounted on a flexible, circular, plastic frame that fits outside the patient's mouth. The dam has one pre-punched hole located slight off center, which Zinc says enables the dam to be positioned anywhere in the oral cavity by simply rotating it prior to placement. Additional holes can be punched in the dam as desired. Zinc notes that radiographs can be taken without the need for removing the dam. The Insti-Dam must be purchased through local dental dealers. The suggested retail price is \$9.99 (retail) for 5 dams (Trial Pack) and

\$62.99 for 50. A non-latex product is available for \$5.99 (3 pack) and \$29.99 (20 pack). A dispenser for the dams that can be placed on the countertop or wall-mounted can also be purchased. For additional information, contact Zirc at (800) 328-3899, (763) 682-6636, (763) 682-6604 FAX, or [www.zirc.com](http://www.zirc.com).  
(Col Charlton)

The **IntraFlow Dental Anesthesia System** is a handpiece that simultaneously penetrates soft tissue/bone and delivers local anesthetic. The process is controlled by a foot pedal, which regulates rotation and infusion speed. The handpiece consists of a 24-gauge needle/drill assembly (0.35 inches in length, 0.022 inches in diameter), and single-use, sterile anesthetic tubing within a transfuser. The low-speed, pneumatic handpiece is compatible with standard clinic equipment, and is designed to hold any type of standard anesthetic cartridge. It is purported to produce profound anesthesia to a targeted tooth within one minute of use. Some of the advantages of this system claimed by its manufacturer include: reduced patient anxiety, no lingering post-operative anesthesia, facilitation of bilateral procedures, and reduced operator time. The handpiece is reported to be ideally suited for procedures that require 60 minutes or less (e.g., routine operative procedures, crown preparations, simple extraction/endodontic procedures, and emergency pain relief). The IntraFlow Dental Anesthesia System is available for \$995.00 (retail/government), and includes the system along with two boxes of disposable transducers (50 total), and a training kit. Additional Systems are priced at \$895.00 (retail/government) and each additional box of transducers is \$62.50 (retail/government). For more information, please contact Intravantage Inc., at (877) 476-4299, (888) 298-1170 FAX, or [www.IntraFlow.com](http://www.IntraFlow.com).

(Col Bartoloni)

The Composi-Tight Sectional Matrix Retainer System (reviewed by DIS in 98-22 and rated Recommended ) has been substantially re-designed by the Garrison Dental Manufacturing. The new product is called the **Composi-Tight Gold Sectional Matrix Retainer System** and has several new features. First, the four sectional matrix bands are approximately 15% longer bucco lingually and have a modified curvature, which the Garrison claims makes them easier to place and able to more easily reproduce the tooth's actual interproximal contact. Two of the bands have a gingival extension to facilitate placing them for gingivally-deep restorations. There are still two styles of stainless-steel rings (those with short tines for shorter teeth and those with longer tines for longer teeth), however they have also been modified. The rings are now substantially stronger (two times stronger, Garrison claims) and more resilient, which are said to provide greater tooth separation for a more effective contact. A new placement forceps is also provided with positive ring engagement to enhance stable placement. Finally, the packaging box has reportedly been made more fracture-resistant. The Composi-Tight Gold Sectional Matrix Retainer System with Placement Forceps (item number AUK2) includes 3 rings each of the two sizes, an assortment of 250 sectional matrix bands, placement forceps, and instructions. It is available for \$199.00 (retail and government) from Garrison Dental Systems at (888) 437-0032, (616) 842-2244, (616) 842-2430 FAX, or [www.garrisondental.com](http://www.garrisondental.com).

(Col Charlton)

GC America recently announced that **Fuji Lining LC** is available as a two-paste version. Fuji Lining LC is a light-cured resin/glass-ionomer liner in the same class as Vitrebond (3M ESPE) and Photac-Bond (3M ESPE). Until recently it was available only as a powder and liquid. GC now packages it as two pastes in a cartridge that fits a metal dispenser. GC claims that the paste/paste version reduces waste, saves time, and ensures that the correct ratio of the pastes is dispensed. Other claims for Fuji Lining LC include an adequate level of radiopacity, a stronger bond to tooth structure (than the powder/liquid version), and a reduction in post-treatment sensitivity. Fuji Lining LC Paste Pak (item number 432571) contains one cartridge, a dispenser, mixing pad, and spatula. It can be purchased for \$99.00 (retail) and \$59.40 (government) from GC America at (800) 323-7063, (708) 597-0900, (708) 371-5103 FAX, or [www.gcamerica.com](http://www.gcamerica.com).

(Col Charlton)

**Cross pin** is a crown and bridge model system supplied by Blue Dolphin Products. The Crosspin system uses the same fabrication technique as current pin-type crown and bridge die systems. The primary difference is the shape of its double-profile single pin, which is cemented into the tooth portion of the



model. A cross-shaped sleeve is then slid over the pin and a base poured around it using a base former. The die can then be sawed out and trimmed in the usual manner. The Crosspin system is said to firmly hold the die stable with absolute precision, even after multiple removals. The manufacturer claims the product saves money because only one pin is used (instead of the usual two). The Crosspin system is available as an intro kit or 1000-pin refill packages. The regular-length intro kit includes 250 pins and sleeves, as well as one drill bit and two base formers. The long-length intro kit includes 250 long pins and sleeves, and one drill bit. See the table below for pricing information. Please note that no government price is currently available. Blue Dolphin Products can be reached at (800) 448-8855, (408) 776-0433, (408) 776-0145, or [www.nesscon.com](http://www.nesscon.com).

Item	Retail Price per unit	Quantity of 5-9	Quantity of 10+
Regular Intro Kit	\$42.95		
Long Intro Kit	\$42.95		
1000-Pin Refill (Regular)	\$96.50	\$87.95	\$82.30
1000-Pin Refill (Long)	\$96.50	\$87.95	\$82.30
1000-Pin Refill (Long Pins/Short Sleeves)	\$96.50	\$87.95	\$82.30
Drill Bit	\$18.50		
Model Former, Full	\$28.90		
Model Former, Quadrant	\$28.90		

(MSgt Osborn)

**Miris** is a new hybrid resin composite from the Coltene/Whaledent. The company claims that Miris uses an innovative shade system that was designed based on color data collected from over one thousand teeth. As a result, Miris was designed to have seven dentin shades and six enamel shades, which are purported to be all that are necessary to replicate all of nature's actual shades. In order to properly use the product, Coltene Whaledent developed a new shade guide that consists of outer shells of the enamel shades and inner cores of the dentin shades. To use the guide, the dentin shade tab is selected by comparing the tabs to the cervical area of the tooth. The enamel tab is then selected by comparing the enamel tabs to the incisal and proximal areas of the tooth. Finally, to evaluate the combined effect of a layering of the dentin and enamel shades, the two tabs are snapped together with the dentin core on the inside and the enamel shell on the outside. Also included in the kit are four Effect shades that provide different optical and characterization effects. Miris is recommended by Coltene/Whaledent for all classes of direct dental restorations and is said to have excellent polishability because of its 0.6-micron average filler particle size. The composite is available in syringes as well as pre-loaded tips. A Miris Tips Set (item number C8465) costs \$378.18 (retail) and \$208.00 (government) from Coltene/Whaledent at (800) 221-3046, (201) 512-8000, (201) 529-2103 FAX, or [www.coltenewhaledent.com](http://www.coltenewhaledent.com).

(Col Charlton)

Bisco has recently introduced **Tyrian SPE Self-Priming Etchant**. The product is intended to be used with Bisco's fifth-generation (i.e., one-bottle) bonding agent, One-Step Plus. The company claims that Tyrian SPE is different from other self-etching primers in two ways: first, it is said to be compatible with light-cured, self-cured, and dual-cured composites and resin cements. Research has found that several other similar self-etching primers produce a very weak bond when used to bond self-cured composites. Tyrian SPE is also said to differ because it can be used to bond composites and resin cements to uncut (i.e., unprepared) enamel. With other self-etching primers, the enamel has to be cut prior to application of the self-etching primer or inadequate bonding will result. Other purported advantages for Tyrian SPE include its purple color which makes it easier to see during placement and its innovative unit-dose mixing/dispensing container. Tyrian SPE (REF-U-2220K) comes in a box of 25 unit-doses, 1 bottle of One-Step Plus, accessories, and instructions. It can be purchased for \$115.00 (retail) and \$69.00 (government) from Bisco at (800) 247-3368, (847) 534-6000, (847) 959-9550 FAX, or [www.bisco.com](http://www.bisco.com).

(Col Charlton)

**Venus Color Adaptive Matrix Restorative** is a new microhybrid resin composite from the Heraeus Kulzer company. The bis-GMA based resin has an average filler particle size of 0.7 microns with a relatively narrow size distribution. Filler content is reportedly 78 percent by weight (61% by volume). One of the products significant features is said to be its innovative shade system. Venus has a total of 27 shades in 3 opacities (enamel, opaque dentin, translucent) and is provided with a shade guide that contains tabs made of the actual composite. The tabs consist of layers of the various shades and are identified on the back of the shade guide by the specific shades required to produce the resulting layered effect. This system is similar to the TruMatch guide first marketed by Dentsply/Caulk with Esthet-X (see DIS 61-15). The advantage of this shade selection method, according to Heraeus Kulzer, is that it gives clinicians the ability to create life-like esthetics. Venus photoactivator is said to be compatible with plasma arc, halogen, and light-emitting diode curing units. Although its depth-of-cure is reported to be 5.2 mm, the company still recommends limiting increments to 2 mm. Other purported advantages of the composite are a marked radiopacity, excellent esthetics, high strength, and good resistance to wear. A Venus Master's Kit (item number 66007955) includes, among other items, pre-loaded tips (i.e., capsules) of all available shades, Gluma Etch 20, and Gluma Comfort Bond + Desensitizer. The kits costs costs \$735.00 (retail) and \$430.02 (government) from Heraeus Kulzer at (800) 431-1785, (914) 273-9379, or [www.heraeus-kulzer-us.com](http://www.heraeus-kulzer-us.com).

(Col Charlton)

The **Harvey PV Dry Table Top Steam Sterilizer** is a fully-automated, microprocessor-controlled, table top sterilizer with a 10-inch diameter by 15½-inch-deep, round, stainless steel chamber. The manufacturer claims that by using vacuum technology, instruments come out completely dry in 35 minutes which reduces drying time by almost 50 percent. Features include a front control panel with a large easy to read LCD display and five factory-preset cycles, which can be adjusted to meet varying user parameters. The patented automatic door design purportedly seals the door and begins the sterilization process upon activation of the start button. When the sterilization cycle is complete and the instruments are completely dry, the chamber door opens automatically. The PV Dry is said to be almost entirely maintenance free using a patented built in non-recirculation system, which keeps fresh water going to the tank in every cycle. The PV Dry can be connected to a printer or data port providing validation and record keeping of sterilization cycles. Included accessories are one rack, and one large and small tray. Optional accessories include a printer, pouch rack, digital pyrometer, and temperature verification probe. The sterilizer is available in two domestic voltage configurations (120VAC; 220-240 VAC) and one international voltage configuration (230VAC), and includes a 2-year warranty. The Harvey PV Dry Table Top Steam Sterilizer is available for \$6,750.00 (retail) and \$4,100.00 (government) from Barnstead International. For government inquiries contact (800) 553-0039 ext 6406, (563) 556-2241 ext 6406, (563) 589-0516 FAX, or [www.barnsteadintl.com](http://www.barnsteadintl.com).

(TSgt Sutter)

The **Transport MDS** from Aseptico is described as a technologically advanced, portable dental that meets the demands of the military dentist in an operational environment. The system is designed to assist in almost any dental procedure ranging from oral prophylaxis to oral surgery. Designed to be lightweight and self-contained, it includes an oil-less air compressor that provides power to the water and air supply subsystems, an integrated water supply for hand piece coolant and oral irrigation, and a waste reservoir for collecting liquids and solids from the vacuum supply subsystem. The Transport MDS supports a variety of standard electric motors and all E-type connected handpieces. The Transport MDS also includes a NATO-compatible power inverter that allows the unit to be operated from any 24-volt military vehicle electrical system. The entire system can be quickly assembled/disassembled and packs into one molded shipping container for safe transport and storage.

The Transport MDS also features the following:

- 3-way autoclavable syringe
- autoclavable 30,000 RPM motor
- four handpiece ratio settings (5:1, 1:1, 1:4, 1:16)
- high- & low-volume evacuation
- variable speed footswitch

- piezo ultrasonic scaler
- high impact case with wheels
- ability to accept 110V or 220V power source.

The Transport MDS dental unit is 10½" H x 14½" W x 24" D, occupies 1.81 ft<sup>3</sup>, and weighs 46½ pounds. Included with the power inverter in the MILSPEC shipping case, the Transport MDS weighs 83.6 pounds and occupies 4¼ ft<sup>3</sup>. The unit has a listed retail price of \$7,500 (government \$7,100) and is available from Aseptico at (800) 426-5913, (425) 487-3157, (360) 668-8722 FAX, or [www.aseptico.com](http://www.aseptico.com)

(Lt Col Roberts)

The **Titan E-lectric Motor System** is Star Dental's titanium-housed, electric handpiece system that is said to be easily retrofitted to almost all existing air-turbine-based dental units. The electric motor is advertised to provide consistent speed and constant torque over a wide speed range with no handpiece stalling during use. In addition to providing optimal operator tactile control, the E-lectric is said to produce low vibration and minimal noise while its cellular glass rod optics are advertised to provide high light intensity. The control unit is designed to require a small footprint with an anti-twist connecting hose. The motor unit is compatible with five E-lectric Attachments (must be purchased in addition to the motor system), which are said to be completely autoclavable. The attachments, depending on the design, are advertised to provide excellent balance and grip, a speed range of 100-200,000 rpm, offer 3-port cooling spray, and push-button autochucks. Detailed attachment information is provided in the following table.

Attachment Design	RPM range	Indication	Part Number	Retail Cost (\$)	Government Cost (\$)
1:1 Friction Grip	1000 - 4000	Caries removal	263474	895	492.25
1:1 Latch Grip	1000 - 4000	Caries removal	263475	895	492.25
1:5 Friction Grip	10,000 - 200,000	Precision cutting, crown and bridge	263472	1075	591.25
16:1 Latch	100 - 2500	Endodontic Treatment	263476	1005	552.75
Straight	1000 - 40,000	Chairside Trimming and Denture Adjustment	263473	795	437.25

The Titan E-lectric Motor System (Part Number 263471) includes the control unit, tubing, electric motor, and A/C adapter retails for \$1850 (govt \$1017.50) and is available at (866) 383-4636, (717) 291-1161, (717) 291-5699 FAX, or [www.dentalez.com](http://www.dentalez.com).

(Lt Col Roberts)

Periodically, articles appear in the literature that present clinically useful information or evaluate the performance of a material or piece of equipment. Because DIS believes that this type of research is of value to clinicians, we present a brief description of these articles to make you aware of them. The complete citation is provided so you can obtain the article if you are interested in reading it in its entirety.

## **DO ENDODONTICALLY-TREATED TEETH REALLY BENEFIT FROM CROWN PLACEMENT?**

Relationship between crown placement and the survival of endodontically treated teeth. Aquilino SA, Caplan DJ. J Prosthet Dent 2002;87:256-263.

Traditionally, it has been accepted that the best treatment for a posterior, endodontically-treated tooth is some form of coronal coverage. This may take the form of a gold, ceramic, resin composite, or amalgam restoration that covers the occlusal aspect of the tooth to prevent it from fracture. The purpose of this retrospective study was to evaluate the hypothesis that crown placement improves the long-term survivability of endodontically-treated teeth. The researchers used a dental school database to identify 280 patients (400 teeth) that had received endodontic during a two-year period. Patient records, radiographs, and a computer database were used to select from this number those who met the inclusion criteria of the study. Kaplan-Meier survival estimates were then generated for those 203 teeth. **Results indicated that endodontically-treated teeth that had not received a crown were lost at a rate six times greater than those that had. The authors concluded there was a strong association between placement of a crown and survival of an endodontically-treated teeth.**

*DIS Comment: Quite a number of previously published articles and scientific papers have voiced the opinion that endodontically-treated posterior teeth (as well as anterior teeth with loss of significant coronal tooth structure) should receive crowns to protect them from fracture and extend their longevity. At least one study has shown that crowned endodontically-treated teeth survive longer than those that were not crowned. As the authors of the current study indicated, crowns are not the only viable option to protect teeth following obturation. Cuspal coverage may also be provided by complex amalgams and by gold, ceramic, and resin composite onlays. Unfortunately, although one would expect that these treatments would function for this purpose at least as well as full coronal coverage, no reports exist in the literature to support this contention. Regardless of the specific treatment employed, the evidence does seem to indicate that obturated teeth benefit from restorative coverage of their fracture-prone occlusal surfaces.*

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## **TOOTH WHITENING AGENTS: WHAT A PAIN**

Sensitivity and tooth whitening agents. Pohjola RM, Browning WD, Hackman ST, Myers ML, Downey MC. J Esthet Restor Dent 2002;14:85-91.

One of the common side effects of bleaching vital teeth is tooth and gingival sensitivity to changes. Several new bleaching products have been marketed to address this problem. This study evaluated three commercially-available products to identify their incidence of sensitivity (involving teeth and soft tissues) and efficacy of whitening. Eighteen patients were divided into three groups of six each. Each of the groups was treated for two weeks with one of the following whitening agents: NiteWhite Excel 2Z (Discus Dental), fx (Challenge Products), and Rembrandt Xtra-Comfort (Den-Mat). Patients kept a daily diary to record sensitivity and the first day they noticed a whitening effect. Shade change and tooth sensitivity were evaluated at recall appointments at 1 week, 2 weeks, and 4 weeks. Results indicated that the two products marketed as zero-sensitivity bleaches (NiteWhite Excel 2Z and Rembrandt Xtra-Comfort) produced no teeth sensitivity and were significantly different in this regard from fx. All produced a statistically similar degree of soft tissue sensitivity. All three were found to be effective whiteners, producing an average shade guide change of 8. **The authors concluded that of the three products, none was sensitivity free, but NiteWhite Excel 2Z and Rembrandt Xtra-Comfort (the zero sensitivity products) did not produce thermal sensitivity. All produced a similar change in shade tab value.**

*DIS Comment: A very common side effect of vital tooth bleaching is transient sensitivity of the teeth and/or soft tissues. Fortunately, the sensitivity is dose-related and transient. Regardless, it is frustrating for patients and enough of an annoyance to dissuade some from finishing treatment. Recently,*

manufacturers have added potassium nitrate an/or fluoride in an attempt to reduce sensitivity. This study indicates that these products are at least effective at reducing the incidence of thermally-related tooth sensitivity, while retaining their effectiveness at tooth whitening. Practitioners should note that they do not reduce soft tissue sensitivity, so patients should be advised that they may experience transient gingival, tongue, or throat sensitivity with these products.

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## WHAT GLOVES SHOULD I BUY?

Performance of latex and nonlatex medical examination gloves during simulated use. Korniewicz DM, El-Masri M, Broyles JM, Martin CD, O'Connell KP. Am J Infect Control 2002;30:133-138.

Today, gloves are made from a variety of nonlatex materials due to an increased incidence of latex allergies reported by healthcare workers. However, there are relatively few studies examining the barrier quality of these nonlatex materials. The purpose of this study was to determine the effects of glove stress, type of material (vinyl, nitrile, copolymer, latex) and manufacturer on the barrier effectiveness of medical examination gloves. A total of 5,510 medical examination gloves (1,464 nitrile, 1,052 latex, 1,006 copolymer, and 1,988 vinyl) were divided into two groups: unstressed and stressed. Unstressed gloves were visually inspected and then water-leak tested following the standards of the Food and Drug Administration (FDA) for barrier efficacy. Stressed gloves were visually inspected, manipulated according to a designated stress protocol, and then evaluated using the FDA water-leak test. Results showed that nitrile gloves exhibited the lowest failure rate (1.3%), followed by latex gloves (2.2%). Copolymer and vinyl gloves had the highest failure rate (both 8.2%). Differences in failure rates were also found among manufacturers, and stressed gloves had a higher failure rate than unstressed gloves. **This report suggests that nitrile medical examination gloves are a suitable alternative to latex gloves, and that vinyl and copolymer gloves offer less barrier protection. The quality of the glove manufacturer, glove material, and stress are essential factors in determining the overall barrier effectiveness of a glove.**

*DIS Comment: This study is the first to report that latex medical gloves are less likely than nitrile gloves to provide an adequate barrier when used in a simulated laboratory stress test. Keep in mind though, that the sample size was limited by the number of gloves tested, the limited choice of manufacturers, and the prescribed stress model. Since this study provided simulated glove use through laboratory testing, additional studies are needed to investigate the durability of examination gloves in actual clinical situations. Other factors that need to be considered include: presence of powder, glove size, hand dominance, use of instruments, complexity of clinical tasks performed, and duration of use.*

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## HOW ABOUT THOSE CARIES DISCLOSING PRODUCTS?

Effect of caries disclosing agents on bond strengths of total-etch and self-etching primer dentin bonding systems to resin composite. Kazemi RB, Meiers JC, Peppers K. Oper Dent 2002;27:238-242.

This study evaluated the effect of two commercially-available caries detection solutions on the bond strength of three bonding products to resin composite. Extracted human molars were sectioned to produce 108 flat dentin surfaces. Thirty-six surfaces were then either left untreated (control) or treated with one of two caries disclosing solutions (Snoop, Pulpdent or Seek, Ultradent). The 36 specimens of each type of treatment were then treated with one of three bonding agents: Prime & Bond NT (a partially filled, total-etch product from Dentsply/Caulk), Clearfil SE Bond (a self-etching primer product from Kuraray), or Prompt L-Pop (a self-etching primer, all-in-one product from Parkell). Tetric Ceram (Ivoclar Vivadent) resin composite was then bonded to the dentin surfaces. The specimens were stored for 24 hours, thermocycled, and tested for shear bond strength. **Results indicated that neither of the two caries disclosing solutions significantly affected the bond strength of the bonding products.**

*DIS Comment: Caries detection solutions have been used by clinicians to distinguish between affected and infected dentin. Affected dentin is the dentin that is adjacent to a carious lesion and is not contaminated by bacteria. While it may be softer than normal dentin, it should be retained because it has the potential for remineralization. Infected dentin, on the other hand, contains bacteria and should be removed during preparation. Several commercial products are now available for distinguishing between*

*the two, such as Caries Detector, Snoop, Seek, and To Dye For. DIS published a synopsis of these products in DIS 63-07. This study evaluated how these products affect the shear bond strengths of some of the newest types of bonding agents. The results of the study should give clinicians who routinely use caries detection solution some reassurance that, for at least the tested bonding agents, no adverse effects occur. It is important to note, however, that the caries detection solutions and bonding agents in this study were tested using sound, intact dentin and not carious dentin as would be the case intraorally. Results may differ when caries-affected dentin is involved. Interestingly, although the purpose of this study was not to compare the bond strengths of the three dentin bonding products, Prompt L-Pop did not perform as well as CLearfil SE Bond and Prime & Bond NT. These are results to similar to those noted by DIS during its evaluation of Prompt L-Pop (see DIS 61-20).*

# GENERAL DENTISTRY

## 66-05 Protemp 3 Garant Temporary Material

(Project 01-55)

Protemp 3 Garant is a self-cured bis-acryl composite recommended by 3M ESPE for the fabrication of provisional (i.e., temporary) crowns, bridges, inlays, and onlays. The material is available in four shades (A1, A3, B0.5, B3) and is supplied in cartridge form for use in an automix dispenser gun. The manufacturer claims that the gun produces a homogeneous, void-free mix. A specially designed dispenser syringe of AddOn, a low-viscosity light-cured resin, is also included with the product. AddOn is used to correct voids or defective margin areas of the provisionals. Provisional restorations made with Protemp 3 Garant are said to be more fracture resistant than those made with other composite products. 3M ESPE also claims that the restorations have excellent marginal adaptation and are fast and easy to polish.

Protemp 3 Garant is packaged in a heavy paper box with a flip-open lid. A laminated, graphics-containing instruction card is included along with a special gun dispenser. Expiration dates and lot numbers are printed on the outside of the box as well as on the cartridges. Although only one shade of Protemp 3 Garant is provided with an order, all four available shades were provided to the clinical users in the DIS evaluation.

### Manufacturer:

3M Dental Products Division  
3M Health Care  
3M Center, Bldg 275-2SE-03  
St. Paul, MN 55144-1000  
(800) 237-1650  
(612) 733-8524  
(800) 888-3132 FAX  
[www.3m.com/espe/index.html](http://www.3m.com/espe/index.html)

### Suggested Retail Price:

\$169.00 Protemp 3 Garant Starter Pack (item number 46943) contains:  
-one 50-mL (67-g) Protemp 3 Garant cartridge (shade A1)  
-one Garant 2 Dispenser  
-15 Garant 2 Mixing Tips  
-one 2-g syringe of Protemp 3 AddOn Material (shade A1)

### Government Price:

\$106.50 Protemp 3 Garant Starter Pack (contents and item number as listed above)

### ADVANTAGES:

- + Produces well-fitting, esthetic provisional restorations.
- + Has an adequately-long working time.
- + Has an appropriate setting time which means provisional restorations can be finished/polished without undue waiting.
- + Automix gun system makes mixing fast, easy, and consistent.
- + Provided good detail reproduction of marginal areas which made finishing easier.
- + AddOn material make it easy and fast to repair voids and defective margins.
- + Comes with excellent graphics-containing summary instruction card.
- + Exhibits very little odor.
- + Lot number and expiration date are stamped on each component in kit.

**DISADVANTAGES:**

- Instructions do not stress need to remove oxygen-inhibited layer prior to finishing.
- Is brittle; should be used cautiously for temporaries in high stress-bearing areas.
- Only provided with one shade in kit; other three must be purchased separately.
- Requires special gun dispenser for the cartridges.
- Is significantly softer than several other provisional materials tested by DIS.
- More expensive per gram than several other popular provisional materials.
- Not sufficiently radiopaque.
- Not shipped with a Material Data Sheet (MSDS).

**SUMMARY AND CONCLUSIONS:**

Protemp 3 Garant performed well in the laboratory and during clinical-user tested. Clinicians reported that Protemp 3 Garant produced esthetic, well-fitting restorations. Users had sufficient time to work with the material before it began to set. Despite the fact that it hardened slightly slower than claimed, it did not take an unduly long time. The shades provided to the evaluators were found to be adequate, however potential buyers should be aware that the standard kit contains only one shade. The automix gun dispenser made it easy to mix the product and produced homogeneous mixes. The cartridges require the use of a special gun, however the Starter Pack includes it. Users particularly liked the provided AddOn resin because it made repairing provisionals simple and fast. They weren't totally satisfied with Protemp 3 Garant, however. They felt the instructions didn't adequately stress the need for removing the resin's air-inhibited layer prior to finishing. Also, as with other resin composite provisional materials, Protemp 3 Garant is brittle and inappropriate for long-span provisionals, particularly where the occlusion is heavy. **Protemp 3 Garant Temporary Material** is rated **Acceptable** for use by the federal dental services.

(Col Charlton)

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**66-06 PoGo One Step Diamond Micro-Polishers****(Project 01-66)**

PoGo One Step Diamond Micro-Polishers from Dentsply/Caulk are used for polishing resin composite and compomer restorative materials. Each is a diamond-impregnated, urethane dimethacrylate disc mounted on a plastic, latch-type, slow-speed handpiece mandrel. The single-use discs are used with increasing light pressure to purportedly produce a highly polished surface. A PoGo Starter Kit contains 40 discs, written instructions, and a laminated instruction card.

**Manufacturer:**

L.D. Caulk Division  
Dentsply International, Inc.  
P.O. Box 359  
Milford, DE 19963-0359  
(800) 532-2855  
(302) 422-4511  
(800) 788-4110 FAX  
www.caulk.com

**Suggested Retail Price:**

\$141.65 PoGo One Step Diamond Micro-Polisher Starter Kit (item number 662001)  
-40 polishing discs

**Government Price:**

\$85.43 Item number and contents as listed above  
Government contract number V797P-3708k

**ADVANTAGES:**

- + Laboratory testing found that PoGo produced an acceptably smooth surface on resin composites.
- + Evaluators reported that the product produced a well-polished surface.



- + Easy to use; requires fewer steps than several other popular polishing products.
- + Durable enough to last an entire appointment.
- + Marketed as disposable, which enhances infection control.
- + Well packaged.
- + Are metal-less so they won't mar the restoration's surface during polishing.
- + Are pre-mounted on latch-type mandrels for rapid placement in handpiece.
- + Written instructions and graphics card were rated highly by users.
- + Lot number and expiration date are printed on product box.

#### **DISADVANTAGES:**

- Are available only as discs, which limits access in some situations.
- Is strictly a polishing product; gross resin reduction must be accomplished by other means prior to polishing.

#### **SUMMARY AND CONCLUSIONS:**

In general, clinical evaluators found that the PoGo discs produced an acceptably smooth, polished surface on resin-based restorations. The product is comparable in price but simpler and easier to use than two other popular polishing products. The discs are nicely packaged and the kit includes well-written, concise instructions. PoGo's main drawback is that it is available only as discs, which limits access in many situations. Users should note that it is intended strictly for polishing and does not effectively remove gross amounts of resin. It was well received by the evaluators, however, with all 10 awarding it an overall rating of Good or Excellent. The **PoGo One Step Diamond Micro-Polishers** are rated **Acceptable** for use by the federal dental services.

(Col Charlton)

## **66-07 NRG LED Curing Light**

**(Project 02-01)**

The NRG LED Curing Light uses focused Light Emitting Diode (LED) technology to polymerize visible-light-activated materials having camphorquinone as their photoinitiator. Dentsply/Caulk claims that the NRG Light is capable of polymerizing a 2-mm-thick layer of most of its visible light-cured materials in 10 seconds. This unit, like other first-generation LED curing lights, uses gallium nitride semiconductors to produce a narrow spectral range that is close to the absorption spectrum of camphorquinone (i.e., 450 to 490 nm). Due to the combination of this more specific spectral range and the LED's superior energy conversion rate compared to halogen lamps, the NRG LED Curing Light is purported to generate sufficient intensity for polymerization using rechargeable batteries rather than line voltage. This allows the NRG! LED Curing Light to be portable and lightweight, and it eliminates the need for restrictive cords. A fully-charged battery is reported to typically provide 250 ten-second exposures (i.e., 40 minutes) without recharging. A fully depleted battery requires overnight recharging. The NRG LED Curing Light, in contrast to the wand design of most other available LED curing lights, uses the more familiar gun-shaped design of conventional halogen curing lights. The controls are located on the handpiece and consist of an on/off button and an activation button. There is no timer selection; only 10-second exposures are available. Longer exposures are accomplished by depressing the activation button every 10 seconds. The NRG LED Curing Light is shipped with a 9-mm-diameter, non-autoclavable light guide containing 7 LEDs. Optional light guides include a 3-mm "tacking probe" for tacking indirect resin restorations, and a 3-mm "transillumination probe." Dentsply/Caulk recommends barrier protection of the light guide or disinfection. The NRG LED Curing Light is 9 inches long and 4½ inches deep and weighs 16 ounces. The charging unit is only available in 120V at this time.

#### **Manufacturer:**

Dentsply/Caulk  
 38 West Clarke Avenue  
 Milford, DE 19963-0359  
 (800) 532-2855 ext 207  
 (302) 422-4511 ext 207  
 (800) 788-4110 FAX

**Suggested Retail Price:**

\$949.95 Includes: Handpiece, 9-mm-diameter light guide, battery charger stand, eye protection shield, and instructions.

**Government Price:**

\$617.00 Includes: same as above.

**ADVANTAGES:**

- + Offers the conveniences of portability and light weight.
- + Is ergonomic and has a familiar gun-shaped design.
- + Adequately polymerizes hybrid resin composite in 35 seconds.
- + Curing tip swivels 360 degrees to facilitate intraoral access.
- + Instructions are clear and easy to understand.
- + Very quiet.
- + Requires little counter space for storage.
- + UL listed.

**DISADVANTAGES:**

- Did not cure Dentsply/Caulk resin composite in 10 seconds as advertised.
- Required 63 seconds to adequately cure microfill resin composite.
- Required more time than the control halogen light unit to adequately polymerize all resin composites tested.
- Activation button is not easy to use because of its inconvenient location.
- Did not maintain initial output throughout battery discharge.
- Not provided with built-in radiometer.
- Rechargeable battery is not replaceable without returning the unit to manufacturer.
- More expensive than most halogen curing lights.
- Curing tip becomes warm with repeated use.
- Handpiece is easy to incorrectly place in charging base.
- Has only one exposure time setting (10 seconds).
- Curing tips are not autoclavable.
- Different types of disinfectants are recommended for curing tip and handpiece.

**SUMMARY AND CONCLUSIONS:**

The NRG LED Curing Light is a lightweight, compact curing light that uses the light emitting diode (LED) technology. Clinical evaluators appreciated its portability, convenience, and gun-shaped design, however the activation button was not placed in the proper position for easy use. The light is advertised by Caulk/Dentsply as being able to polymerize resin composites in 10 seconds. DIS testing could not substantiate this claim even when a Dentsply/Caulk resin composite was used. Using the same resin composites as in past evaluations, the NRG LED Curing Light adequately polymerized the hybrid resin composite in a timely manner, but not the microfill resin composite. However, previous DIS testing has found that most standard (i.e., average-intensity) halogen lights also inadequately polymerize microfill resin composites unless used for 60 seconds. Only high-intensity halogen lights (i.e., with an output of  $>1000 \text{ mW/cm}^2$ ) can predictably polymerize microfills in 40 seconds or less. When using an average-intensity halogen light (i.e., 300 to 600  $\text{mW/cm}^2$ ) to cure a 2-mm-thick resin composite, 40 seconds are required to adequately polymerize a hybrid resin composite and 60 seconds for a microfill. DIS testing found that the NRG LED Curing Light required approximately the same amount of time (35 seconds and 63 seconds) to polymerize the same materials. Because the unit's LEDs are at the end of the curing tip, the tip is not autoclavable. Adding to this problem is the fact that two different classes of disinfectants are recommended for the curing tip and plastic handpiece. Despite its numerous disadvantages, the clinical evaluators rated the light as "Good" to "Excellent," primarily because of its portability and light weight. Unfortunately, the advantages of portability and ease of use do not outweigh the inability of the light to meet advertising claims. The **NRG LED Curing Light** is rated **Marginal** for use by the federal dental

services.

(Col Leonard)

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## **66-08 W&H/A-dec Synea TA-96LW & TA-98LW Fiberoptic High-Speed Handpieces Update**

### **(Project 01-49)**

The W&H Synea TA-96LW and Synea TA-98LW fiberoptic high-speed handpieces are imported from Austria and distributed by the A-dec Corp. Complete evaluations of the previous models (Synea TA-96L and Synea TA-98L) were published by DIS in 2001 (see *DIS* 61-29 and *DIS* 61-30). The fiberoptics in the original models were found to degrade as much as 79% after 1000 simulated clinical use/sterilization cycles. The fiberoptics have been redesigned since the evaluations and are claimed to be greatly improved. The purpose of this project was solely to evaluate the adequacy of this new fiberoptic system.

#### **Manufacturer:**

W&H Dentalwerk/A-dec  
2601 Crestview Drive  
Newberg, OR 97132  
(800) 547-1883  
(503) 537-2764  
(503) 538-8021 FAX

#### **Suggested Retail Prices:**

Synea TA-96LW	\$890.00
Synea TA-98LW	\$890.00
924 Roto Quick Coupler	\$210.00
Replacement Turbine	\$295.00
Replacement Fiberoptic Bulb	\$33.50

#### **Government Prices:**

Synea TA-96LW	\$459.93
Synea TA-98LW	\$459.93
924 Roto Quick Coupler	\$108.52
Replacement Turbine	\$175.23
Replacement Fiberoptic Bulb	\$19.90

#### **SUMMARY AND CONCLUSIONS:**

The new models, Synea TA-96LW and Synea TA-98LW, demonstrated significantly greater resistance to fiberoptic degradation than the previously evaluated versions of the handpieces. The new versions retained 80% of their original fiberoptic transmission at the end of the test period (1000 simulated clinical use/sterilization cycles). The poor fiberoptic performance of the earlier models was largely responsible for their receiving ratings of "Acceptable." With their improved fiberoptic performance, the **W&H Synea TA-96LW and W&H Synea TA-98LW** handpieces are now rated **Recommended** for use by the federal dental services.

(Col Leonard, Lt Col Roberts, Mr LaForge)

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## **66-09 Cavitron Select SPS**

### **(Project 01-42)**

The Cavitron Select SPS (CSS) is a portable ultrasonic scaling unit manufactured by Dentsply/Professional. It is an upgraded version of the Cavitron Select unit that was previously evaluated by DIS (see *DIS* 63-11). The CSS has a 350-mL, self-contained water reservoir powered by an internal pump. The unit produces a frequency of 30,000 cycles per second (30 kHz), which is in the reported optimal frequency range of most ultrasonic scalers. Upgraded features to this model are listed in the following table.

Feature	Purported Benefit
Sustained Performance (SPS)	maintains the unit's power level when the insert tip encounters tenacious calculus
Blue Zone Setting (an extended low power range)	provides greater patient comfort during subgingival scaling
Foot Control Power Boost	enables user to temporarily increase power output without touching the unit
Sterilizable Handpiece	enhances infection control
Magnetic Handpiece Holder	securely retains handpiece between uses
Lavage Flow Control	allows for easy and convenient adjustment of the tip's water output rate

The unit is shipped with the following items: 1) foot control; 2) handpiece attachment; 3) water line; 4) AC power cord; 5) universal power supply; and 6) instruction manual. Note that the standard CSS comes without the reservoir bottle and pump; the reservoir bottle and pump must be purchased separately. With reservoir bottle and water, the CSS is 11½" L x 3" W x 4"D .

**Manufacturer:**

Dentsply/Professional  
1301 Smile Way  
York, PA 17404  
(800) 989-8826 (ext 8632)  
(800) 278-4344 FAX  
www.dentsply.com

**Suggested Retail Price:**

\$1,858.50 Cavitron Select SPS (part number 90264)  
\$410.95 Reservoir and pump (part number 90146)  
\$23.70 Reservoir bottle (part number 90148)

**Government Price:**

\$1,213.39 Cavitron Select SPS (part number 90264)  
\$268.49 Reservoir and pump (part number 90146)  
\$15.53 Reservoir bottle (part number 90148)

**ADVANTAGES:**

- + Power boost feature worked very well.
- + Highly rated for comfort by patients.
- + Produced very little heat during operation.
- + Minimal noise is produced at handpiece tip.
- + Can be connected to a dedicated dental unit water supply, if desired.
- + Compact, light, and very portable.
- + Provided with an effective waterline disinfection protocol.
- + Handpiece insert is sterilizable.
- + Reservoir can be autoclaved.
- + Handpiece is very light.
- + Good tactile sensitivity.
- + Accommodates the use of different irrigation solutions.
- + Logical placement of operational controls.
- + Smooth finish facilitates asepsis.
- + Very easy to set up.

- + Easily identifiable water control adjustment is located on the end of handpiece.
- + Magnetic handpiece holder on unit allows easy placement and retention of handpiece.
- + Full two-year warranty.

#### **DISADVANTAGES:**

- Weight of unit may not prevent it dislodgment from stand or counter top.
- Noise level of integral pump may be annoying.
- Water reservoir may be inadequate for lengthy patient appointments.
- Handpiece water line hose and foot control cord are too short.

#### **SUMMARY AND CONCLUSIONS:**

The Dentsply Cavitron Select SPS (CSS) is an upgraded version of the Cavitron Select with several advanced features. It earned high ratings from the clinical evaluators who appreciated its ease of use, power, and comfort. Its ability to use irrigation from either its self-contained reservoir or from the dental unit water supply enables the unit to be used in dental treatment rooms, operating room theater, and in the field. One clinical evaluator was so impressed with the CSS that his clinic purchased two units after the evaluation. The CSS is one of the few units for which the manufacturer provides an effective waterline disinfection protocol. The few disadvantages noted during its evaluation were a somewhat objectionable noise level from the reservoir pump, short cords, and the potential for the unit to be dislodged from the treatment stand or countertop. The **Dentsply Cavitron Select SPS** is rated **Recommended** for use by the federal dental services.

(MSgt Belde)

## **66-10 DELight Dental Laser System**

**(Project 01-34)**

The DELight Laser System is an erbium:yttrium-aluminum-garnet (Er:YAG) laser marketed by Continuum Lasers for dental applications. The DELight emits a pulsed, 2.94-micron wavelength laser beam that is highly absorbed by water or water-containing tissues. The laser has been received FDA approval for dental hard and soft tissue applications. It is purported to be able to perform cavity preparations of all classes and to remove existing resin composite restorations. This laser system, however, is not intended to remove amalgam restorations.

Because the wavelength of the Er:YAG laser is highly absorbed by water-containing tissues, its ablation rate and efficiency are dependent on the target tissue's water content. The water content of enamel, dentin, and dentinal caries differ, so power levels required for ablation of each are respectively different. Enamel, with the lowest water content, requires correspondingly more energy than dentin. Dentinal caries, which has the greatest water content of tooth tissues, requires less energy for ablation/removal than healthy dentin. Approximate energy settings for various hard tissue removal have been established by the manufacturer. Since the energy requirement for removing carious dentin is less than that required for healthy dentin, careful use of the DELight laser should theoretically remove only carious dentin. However, this has yet to be demonstrated by scientific studies.

The DELight Laser System has an energy output of up to 350 milli Joules, operates only in a pulsed mode, and has repetition rate settings of 3, 10, 20, 25, or 30 pulses per second. The 360-degree, swivelled handpiece features a pulsed, visible white light for aiming. The laser can be configured for 115-volt current and either 50 or 60 Hz. The unit is 30" H x 10" W x 18" L, weighs 90 pounds, and is on a roller-based chassis.

#### **Manufacturer:**

Continuum Lasers  
 3150 Central Expressway  
 Santa Clara CA 95051  
 (800) 532-1064  
 (408) 727-3240  
 (408) 727-3550 FAX

**Retail Cost:**

\$44,500 DELight Dental Laser System (leasing options are also available); includes:

- DELight dental laser
- footswitch
- water input connector and tubing
- air input connector and tubing
- fiber optic cable
- 2 handpiece sleeves
- assortment of 10 treatment tips, (80°, 30°, straight, soft tissue)
- 90-degree handpiece for posterior occlusal preparations
- power cord
- 2 external water bottles
- operation manual
- clinical procedures guidelines

Accessories:

- 3 safety goggles (pediatric glasses also available)
- 2 keys for Interlocking Safety Switch
- laser safety sign

**Government Cost:**

\$39,900 DELight Dental Laser System (same items and leasing option as above)

**ADVANTAGES**

- + Is FDA approved for soft- and hard-tissue applications.
- + Provides a conservative means for removing carious tooth structure.
- + Laser dentin preparation does not appear to produce a traditional smear layer, which has been shown to interfere with the performance of some adhesive products.
- + Energy settings are provided by the manufacturer for various clinical uses.
- + Owner s manual is complete and easy to understand.
- + Relatively easy to set up.
- + Has a moderate, but gradual, learning curve.
- + Meets electrical safety standards.
- + Initial training on laser use and safety is provided by the manufacturer.
- + Required laser safety signs and glasses are provided by the manufacturer.

**DISADVANTAGES:**

- Expensive.
- End-cutting nature of probe may not be as conservative for preparing tooth structure as using sm all carbide burs.
- Requires meticulous attention during cleaning and sterilization procedures.
- Does not totally replace the air-turbine handpiece.
- Requires ophthalmologic medical surveillance for USAF users.

**SUMMARY AND CONCLUSIONS:**

The DELight is an Er:YAG dental laser system that has FDA approval for both hard- and soft-tissue applications. DIS found the that unit was easy to assemble by following the manufacturer s instructions. The instructions for use were clear and complete, with helpful color photographs. During laboratory evaluation, the DELight met all electrical safety standards, and made preparations on smooth surfaces that were as conservative as those made by a 329 bur. For more involved preparations (i.e., where lateral removal of tooth structure is required) the laser was as conservative as using ½ and ¼ round fissure burs for the initial outline form. However, the lasers contact tips used during this evaluation were only end cutting and may not be as conservative as standard carbide burs for preparations that require lateral extension. Review of the literature suggests that Er:YAG laser treatm ent of dentin does not adversely affect the dentin s bond strength to common bonding agents. Drawbacks of this laser include its high cost

and the need for meticulous attention to detail when cleaning and sterilizing the laser contact tips. The **DELIGHT Dental Laser** is rated **Acceptable** for use by the federal dental services.

(Lt Col Roberts)

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## 66-11 Coltosol

(Project 01-66)

Coltosol Temporary Material is a noneugenol, self-setting, single-component material for the temporary restoration of teeth. The manufacturer claims that the zinc oxide/zinc sulphate-based cement is retained well by tooth structure and is easy to remove in large pieces. Product instructions recommend that the cavity be moist prior to placing Coltosol because water causes it to set. The manufacturer claims that its surface hardens in 20 to 30 minutes and that it can be subjected to occlusal forces after 2 to 3 hours. Coltosol is packaged in 8-g syringes which are individually sealed in foil pouches and can be purchased in quantities of one or five.

### Manufacturer:

Coltene/Whaledent  
750 Corporate Drive  
Mahwah, NJ 07430  
(201) 512-8000  
(201) 529-2103 FAX  
(800) 225-9382  
[www.coltenewhaledent.com](http://www.coltenewhaledent.com)

### Prices:

Quantity	Item Number	Retail Price	Government Price
one 8-g syringe	C5935	\$5.93	\$3.08
five 8-g syringes	C5930	\$20.41	\$10.61

### ADVANTAGES:

- + Does not contain eugenol.
- + Convenient to use because it does not need to be mixed and dispenses easily from syringe.
- + Adequately radiopaque for radiographic detection.
- + Has pleasant peppermint odor and flavor.
- + Provided with a Material Safety Data Sheet (MSDS).

### DISADVANTAGES:

- Extremely poor durability; material often washed out within days of placement.
- Sets very slowly.
- Material expands during setting and may fracture thin enamel margins.
- Cavity must be moist during placement.

### SUMMARY AND CONCLUSIONS:

Coltosol Temporary Material received low ratings from the clinical evaluators because of its lack of durability and extremely slow setting rate. Commonly, the users found that the material had washed out of the tooth (teeth) within days of placement. These are particularly undesirable characteristics for a temporary material that may be used for treating deployed troops in the field. To be clinically acceptable, a temporary material must adequately seal the preparation, be durable enough to last for at least the short term, provide thermal protection, and set in a reasonable amount of time. Coltosol failed in these regards. As a result, none of the eight evaluators recommended it be purchased to replace their clinic's current temporary material. The product was not without some positive features, however. It is adequately radiopaque and users found it more convenient to use than some of their other temporary materials.

because it does not need to be mixed prior to placement. Also, it can be removed easily and, because it has no eugenol, it will not have an adverse effect on the polymerization of subsequently-placed resin restorative materials or cements. Unfortunately, the significant shortcomings of this product far outweigh these positive features. **Coltosol Temporary Material** is rated **Unacceptable** for use by the federal dental services.

(Col Charlton)

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## **66-12 Hawe Adapt® Sectional Matrix System**

**(Project 02-06)**

The Hawe Adapt® Sectional Matrix System is a product for establishing proper interproximal curvature and contact for resin composite and amalgam restorations. The system consists of four basic items: sectionals, shapers, Luciwedges®, and a set of metal forceps for placing the shapers. The sectionals are thin (0.03-mm-thick), metal or plastic matrices that come in four varieties based on height (5 mm and 6.5 mm) and curvature (moderate and increased). The shapers are transparent, plastic rings that are placed on the involved tooth to stabilize, adapt, and shape the matrices interproximally. The metal forceps are said to engage notches on the inner aspect of the spacers to securely hold them and facilitate their placement and removal. Finally, transparent plastic wedges called Luciwedges® are included in the kit to adapt and seal the matrix in the cervical interproximal area. The Luciwedges® have a hard plastic body with a soft, elastic sole that extends slightly up the sides. It is claimed that the sole allows the wedge to adapt to the contours of the tooth during placement. Note that two types of Adapt® System Kits are available: kit number 740 that has only stainless-steel sectionals and kit number 750 with only plastic sectionals. For the DIS evaluation, the metal sectional kit was provided to the clinicians along with a supply of plastic sectionals.

### **Manufacturer:**

KerrHawe  
1717 W. Collins Avenue  
Orange, CA 92867-9880  
(800) 537-7123  
(714) 516-7400  
(714) 516-7633 FAX  
<http://www.hawe.ch/>

### **Suggested Retail Price:**

\$136.75 Hawe Adapt® Sectional Matrix System (item number 740 for metal sectionals, item number 750 for plastic sectionals). Each kit contains:  
-200 sectionals (50 each of the four heights/curvatures),  
-200 approximal shapers  
-1 pair of application forceps  
-Hawe Adapt® Luciwedges® (5 each of small, medium, large)

### **Government Price:**

\$77.90 Hawe Adapt® Sectional Matrix System (item numbers and contents as listed above)

### **ADVANTAGES:**

- + Shapers provide wedging as well as matrix adaptation and contouring.
- + Shapers help adapt the sectionals to the proximal contours of the tooth.
- + Shapers are stable after placement.
- + Forceps securely held the shapers and facilitated their placement and removal.
- + Four sizes/curvatures of sectionals come in the kit.
- + Sectional matrices were judged by users to be sufficiently wide and long.
- + Plastic sectionals have a color strip to make it easier to see them during and after placement.
- + Translucency of the shapers and plastic sectionals enhances light penetration for light-activated



restorative materials.

- + Extremely well-designed packaging keeps all items within the kit and separated from each other.
- + Provided with nicely done graphics-containing card that provides clear instructions for use.
- + One-time use of shapers and sectionals enhances infection control.

#### **DISADVANTAGES:**

- Shapers must be used with caution and with a rubber dam because they lack radiopacity.
- Shapers are difficult to orient until user has more experience with them.
- Wedging effect of the shapers appeared to be minimal.
- Some users may feel it necessary to place compound or other material to provide additional stabilization for shapers.
- Translucency of the shapers and Luciwedges® makes it difficult to assess if they have been placed correctly.
- Too few Luciwedges® are provided in kit.
- Kits contain either metal sectionals or plastic ones, but not both.
- More time consuming to use than Tofflemire retainer, particularly with MOD restorations.

#### **SUMMARY AND CONCLUSIONS:**

The Adapt® Sectional Matrix System is specifically designed to make it easier for clinicians to produce posterior resin composite restorations with acceptable proximal contours and contacts. The packaging and graphics instruction card are particularly well done. In general, Adapt® was relatively well-accepted by the clinical evaluators who found that it helped provide an appropriate curvature to their restorations. There is a learning curve to the product because orientation of the shapers is somewhat counterintuitive. It was not particularly effective, however, in establishing a solid proximal contact. The translucency of the shapers and Luciwedges® promotes light transmission during curing, however it makes it difficult to determine if they have been properly placed. Most users found the shapers were easy to place using the supplied forceps and were stable after placement. Some users, though, may want to provide additional stabilization using compound. It is important to note that the shapers are not radiopaque, so they must be used with care and in conjunction with a rubber dam to prevent their inhalation or ingestion. Only three of the six evaluators recommended purchasing the product for their clinics. The **Adapt® Sectional Matrix System** is rated **Acceptable** for use by the federal dental services.

(Col Charlton)

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## **66-13 Midmark Concept LR Dental Chair**

**(Project 01-57)**

The Midmark Concept LR Dental Chair is a cantilever-based hydraulic dental chair engineered around a cast-iron frame, which is claimed to provide outstanding strength and stability. The chair features the Midmark Octaglide System, a combination of eight, anti-friction rollers that provides smooth chair movement. In addition, all major pivot points are said to be made of high-precision steel that operates on lubricated-for-life bronze bearings. The manufacturer states that all electrical and other connections are internally plumbed to provide both protection and asepsis, meeting Underwriter Laboratory 2601 Standards that will not be mandatory until January 2005. The Concept LR chair also features seamless upholstery, double articulating headrest, programmable footrest control, and two hip-post mounted programmable controls. The base is said to swivel 30 degrees allowing easy patient access. The chair is available in both 115 and 230-volt configurations and is compatible with both 50 and 60 Hertz. This project evaluated the LR chair with the ultra leather upholstery upgrade and was done in conjunction with concurrent evaluations of the L/R Dental Unit and the Midmark Operatory Light.

#### **Manufacturer:**

Midmark Corporation  
60 Vista Drive  
PO Box 286  
Versailles, OH 45380-0286  
(800) 643-6275

(937) 526-3662  
(800) 365-8631 FAX  
www.midmark.com

**Suggested Retail Price:**

Midmark Concept LR Dental Chair (Part # 153592-003)

\$8,250.00 with standard upholstery

\$8,880.00 with Ultra leather upholstery upgrade

**Government Price:**

Midmark Concept LR Dental Chair (same part number as above)

\$4,718.48 with standard upholstery

\$5,047.12 with Ultra leather chair upholstery upgrade

**ADVANTAGES:**

- + Provides smooth, jerk-free movement to all positions.
- + Stable in all operating positions.
- + Operated reliably during the course of the evaluation.
- + Provides adequate comfort for dental patients.
- + Is easily converted from right- to left-handed use.
- + Made of high-quality materials.
- + Does not hinder access for patient care.
- + The headrest is easy to adjust.
- + Met all electrical safety requirements.
- + Is esthetically designed.
- + Met most pertinent requirements of Medical Procurement Item Description (MPID) #2 for dental chairs.
- + Assembly is straightforward using provided instructions.
- + Maintenance and service literature is clear and complete and is supplemented with helpful diagrams.
- + 2-year limited warranty

**DISADVANTAGES:**

- Arm rest length will not support phlebotomy and intravenous procedures.
- Foot control buttons may be difficult to see and activate.
- Touch pad programming button may be overlooked by users who are unfamiliar with the operating manual.
- Plush upholstery may present asepsis and longevity concerns for some users.
- Chair movement may be perceived as slow by some providers.
- Costs from \$520.00 to \$1849.00 more than other dental chairs on the federal government contract.

**SUMMARY AND CONCLUSION:**

The Midmark Concept LR Dental Chair is an esthetically pleasing, stable dental chair that is solidly built of high-quality components. It met all electrical safety requirements and most of the pertinent requirements of MPID #2. The chair was easy to assemble and all of the manufacturer's documentation was clear and complete. The chair generally functioned well during laboratory testing and was appreciated by clinical evaluators because of its smooth, jerk-free movement and patient comfort. Noted drawbacks include difficulty in seeing the foot control buttons, the unusual location of the touch pad controls, the inability of the arm rests to support IV procedures, and cost. The **Midmark Concept LR Dental Chair** is rated **Acceptable** for use by the federal dental services.

(TSgt Sutter)

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## 66-14 Midmark Procenter LR Dental Unit

(Project 01-56)

The Midmark Procenter LR Dental Unit is a system that is designed to integrate with Midmark dental chairs. The Procenter control head supports up to three air-turbine handpieces and a provided three-way

syringe. Practitioners are said to have quick access to the needle-valve air/water controls from the control head top via a hinged panel. For chair positioning, the unit has a standard foot control as well as a sealed, programmable touch pad control which is located above the handpiece support arm. Midmark claims that the Procenter LR allows convenient conversion from left-to-right using pivot mechanisms that enable the control head, light, and assistant instrumentation to be placed in almost any position. One final purported feature is that all internal components usually found in a side console are either within the control head or the contoured floor box.

**Manufacturer:**

Midmark Corporation  
60 Vista Drive  
P.O. Box 286  
Versailles, OH 45380  
(800) 643-6275  
(937) 526-3662  
(877) 725-6495 FAX  
www.midmark.com

**Suggested Retail Price:** \$5,095.00

**Government Price:** \$2,933.60

**ADVANTAGES:**

- + Good clinical performance during the course of the evaluation.
- + Solidly constructed of sturdy components.
- + Easy left-to-right conversion.
- + Smooth, rounded, aseptic design.
- + Features individual handpiece, drive-air, and water adjustments.
- + Kink-valves are easy to locate and examine inside the control head; should simplify troubleshooting.
- + All controls are accessible by opening the lid of the unit.
- + Internal tubing is color-coded for ease of assembly and service.
- + Positive latch brake assembly for the control head arm provides drift-free operation.
- + Assembly instructions are complete with excellent diagrams that are easy to read.
- + Two-year warranty on unit components; ten-year limited warranty on kink-valve modules.
- + Excellent customer service during the course of the evaluation.

**DISADVANTAGES:**

- No visible master "air on" indicator on the control head.
- Evaluators found it difficult to access water control during patient treatment.
- More expensive than comparable dental units.

**SUMMARY AND CONCLUSIONS:**

The Midmark Procenter LR Dental Unit met most of the pertinent laboratory testing requirements of ADA Specification #47, NFPA 99, and Dental Unit Medical Procurement Item Description #2. The unit is esthetic with smooth contours, and it functioned very well during the course of the evaluation. The Procenter LR is solidly built and has thoughtful and intelligent design features not usually seen with other dental units. As an example, the control head's design simplifies the unit's operation while allowing easy access for servicing. Additionally, it allows convenient left-to-right conversion, has easily accessible color-coded air/water adjustments for handpieces, and has chair controls on the unit's front. Approximately half of the clinical evaluators gave it an overall rating of "Good" and compared it favorably with dental units with which they were experienced. It is, however, more expensive than other popular dental units used in federal clinics. The **Midmark Procenter LR Dental Unit** rated **Acceptable** for use by the federal dental services.

(Mr. LaForge, Lt Col Roberts)

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## 66-15 Midmark Concept LR Operatory Light

(Project 01-58)

The Midmark Concept LR Operatory Light is a newly-designed dental operatory light that is advertised as delivering reduced-shade white light for dental procedures. The unit is said to contain an integrated microprocessor that monitors electrical voltage to ensure that the light output has the proper color-correct brightness. It offers three light-intensity settings (3300, 2500, and 1700 foot candles) at a 27-inch focal length as well as a composite-safe mode. The latter's intensity (700 foot candles) is said to provide illumination during resin composite placement but not so much that premature polymerization of the resin occurs. In place of the usual toggle switch, the light features a touchpad control with LED indicators for the different light-intensity settings. The Concept LR Light also has a unique automatic on/off feature that is activated by a change in the vertical position of the light. Midmark's claims that the light's ergonomic design permits three-axis control using anti-friction bearings with tension adjustments for individualized motion control. The light is described in company literature as having a 3" x 8" oval, feathered-edge light pattern with a  $5000 \pm 500^\circ\text{K}$  color temperature. The Concept LR Light can be installed in different configurations (e.g., on units, ceilings, cabinets, and walls) and is available in both 115- and 230-volt, 50/60 Hz electrical configurations.

### Manufacturer:

Midmark Corporation  
60 Vista Drive  
P.O. Box 286  
Versailles, OH 45380  
(800) 643-6275  
(937) 526-3662  
(877) 725-6495 FAX  
www.midmark.com

### Suggested Retail Price:

\$1,900.00 Midmark Concept LR Light (Item #153584)

### Government Price:

\$1,289.67 Midmark Concept LR Light (same item number as above)

### ADVANTAGES:

- + Provides excellent illumination for dental procedures.
- + Meets all electrical safety requirements.
- + Has automatic on/off feature that is activated by a change in the light's vertical position.
- + Meets International Standard 9680 requirements for illumination pattern consistency, radiant heat production, color-coordinated temperature, and shadow pattern size.
- + Bulb is easy to remove and replace.
- + One-year warranty (except for the bulb).
- + Installation and operation manual is well organized and complete.

### DISADVANTAGES:

- Controls are not intuitive to use.
- More expensive than other dental lights commonly used by the federal services.

### SUMMARY AND CONCLUSIONS:

The Midmark LR Operatory Light is designed to provide strong illumination for dental procedures. The light met electrical safety requirements as well as most of the items from the Medical Procurement Item Description #2 for dental operatory lights. The light also met international standards for illumination pattern consistency, radiant heat production, color coordinated temperature, and shadow pattern. Clinical evaluators appreciated its even area of illumination and intensity. Clinical users reported that the LR Light's operational controls were counterintuitive, and they did not fully utilize the automatic on/off feature or the light's composite mode feature. This light is more expensive than lights currently in use in the federal services. The **Midmark Concept LR Operatory Light** is rated **Acceptable** for use by the federal

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## 66-16 Demetron LC

## (Project 02-15)

The Demetron LC Curing Light is Demetron/Kerr's latest entry into the visible light curing market. The Demetron LC is an attractive, hand-held, corded visible light polymerization system. The unit is designed for simple operation and to provide high-quality results in an economical package. It consists of a pistol-style handpiece attached via a six-foot cord to a power unit intended for use only on a countertop or cart. It is equipped with the same Demetron 80-watt quartz-halogen OptiBulb found in the company's more expensive models. An autoclavable 8-mm curing tip is included, however the handpiece accepts all optional Demetron curing tips. The master power switch is located on the power unit and the on/off activation control is positioned on the handpiece. The Demetron LC offers only one curing mode (full intensity), and there is no timer selection; once the light is activated, it continues to run until the activation control is depressed a second time. Exposure length is indicated by an audible beep every 10 seconds. The minimum output is reported to be 600 mW/cm<sup>2</sup> with the standard 8-mm curing tip, and over 1000 mW/cm<sup>2</sup> with Demetron's optional Turbo Tip (not supplied). The cooling fan runs continuously, and Demetron recommends that it run for 4 minutes after the last activation prior to the unit being powered off. The Demetron LC is available in both 120V and 220V models and is CSA certified. The power unit and handpiece measure 5.5" H x 9.5" W x 10" L and weigh 5 lbs 10 oz. The pistol handpiece alone weighs 10 ounces.

### Manufacturer:

Demetron/Kerr  
21 Commerce Drive  
Danbury, CT 06810-4153  
(800) 537-7123  
(714) 516-7400  
(800) 537-7345 FAX  
(714) 516-7635 FAX  
www.kerrdental.com

### Suggested Retail Price: \$412.00

Includes: Demetron LC, 12-volt/80-watt OptiBulb, 8-mm-diameter autoclavable fiberoptic curing tip, and protective light shield

**Government Price:** \$250.00 Includes: same as above.

### ADVANTAGES:

- + Has a high-intensity output comparable to that of more expensive Demetron models.
- + Economical.
- + Simple and easy to use.
- + Power unit is very stable.
- + Handpiece can be placed either to left or right in the power unit cradle.
- + Accommodates a wide range of sterilizable curing tips.
- + Light shield is easy to position.
- + Curing tips swivel 360 degrees.
- + On/off activation switch is ergonomically placed.
- + Easily cleaned or barrier protected.
- + CSA certified.

### DISADVANTAGES:

- Cooling fan runs continuously.
- No exposure time selections.
- Only one curing mode (full intensity).

- No voltage regulator.
- Can't be wall mounted like previous Demetron models.
- Only one disinfectant is recommended for use on units external surfaces.

#### **SUMMARY AND CONCLUSIONS:**

The Demetron LC Curing Light is well-designed, easy-to-use, and very economical. It is the perfect curing light for a clinic that needs a high-intensity light without a lot of bells and whistles. For its \$250 price (government), it delivers exceptional performance, but it does have some limitations. For instance, it does not have the users to pre-select time exposures, but can only be turned on and off. An audible beep every 10 seconds allows the user to determine the length of exposure. In addition, there is only one curing mode available (full intensity). Because it lacks a voltage regulator, clinics in areas susceptible to power surges and inconsistent voltage should avoid this model because the unit's irradiance output varies as the voltage changes. Depending on individual clinic needs and resources, the light offers an exceptional value for the money. The **Demetron LC Curing Light** is rated **Acceptable** for use by the federal dental services.

(Col Leonard)

## **LABORATORY**

### **66-17 Emmevi Aqua Steam Cleaner**

**(Project 01-76)**

The Aqua Steam Cleaner is a compact, portable, tabletop steam-cleaning unit designed for dental laboratory use. Its three-liter internal boiler tank is constructed of stainless steel and has a refill capacity of 1½ liters with a reserve of ¾ of liter. Steam is produced by heating the boiler tank with an internal 1500-watt heating element. Water is added through a filler neck located on top of the machine. The filler cap on the unit DIS evaluated had a safety relief valve built into it, which is designed to vent pressure in excess of 8½ bar (123 psi). The manufacturer has recently modified the steam cleaner's design by moving the safety relief valve, making it an internal feature attached to the unit's boiler. When pressure exceeds 8½ bar, excess steam is expelled inside the machine and out through side vents in the cabinet. Steam is dispensed during use by a steam pistol that is connected to the unit by a 4-foot-long hose. The steam pistol can be used either as a hand-held device or positioned in its holder on the unit and used in a hands-free mode. A foot-activated switch controls the flow of steam through the steam pistol. The front-located control panel includes the following features: an analog pressure gauge to indicate current steam pressure, a regulator to adjust steam pressure from 4 bars (58 psi) to 6½ bars (94 psi), a red element warning light, an orange water reserve warning light, and an illuminated rocker power switch. External panels of the Aqua Steam Cleaner are made of stainless steel and also feature a top-located carrying handle for portability. The Aqua Steam Cleaner measures 11.8" H x 11.8" W x 15.7" D, is available in both 115- and 230-volt configurations, and weighs 19.8 lbs. The Aqua Steam Cleaner has a 12-month warranty from the date of purchase.

#### **Distributor:**

Harris Discount Supply  
 7506 West Melrose Lane  
 Oklahoma City, OK 73127  
 (800) 227-8524  
 (405) 440-2299 FAX  
 www.harrisdiscount.com

#### **Suggested Retail Price:**

\$669.00 Aqua Steam Cleaner, includes:  
 -Use and Maintenance Handbook  
 -1 funnel

- 2 cap gaskets
- 1 nozzle tips assortment

**Government Price:** same as above

**ADVANTAGES:**

- + Built-in holder for steam pistol allows for hands-free operation.
- + Internal boiler and external case are constructed of stainless steel.
- + Well insulated; only slightly warm to the touch during operation.
- + Compact in size and easy to transport with its built-in carrying handle.
- + Steam regulator allows user to change steam pressure for different jobs.
- + Attractive price.

**DISADVANTAGES:**

- No water level gauge.
- Refill instructions must be followed closely.
- Needs to be refilled during the workday when used in a high-production laboratory.

**SUMMARY AND CONCLUSIONS:**

The Aqua Steam Cleaner is a portable, compact steam-cleaning unit that easily fits on a tabletop. The entire unit is well insulated with no bare pipes or fittings that could create a burn hazard. It has a hand-held steam pistol that uses a unique holder that allows for hands-free steam-cleaning convenience. Evaluators found the steam cleaner's adjustable pressure regulator to be useful for cleaning various types of prostheses. Users noted that it is important to fill the unit only with the amount of distilled water recommended by the manufacturer. If overfilled, the steam cleaner expels excess water from the safety/fill cap. The manufacturer recently modified the steam cleaner's design by moving the safety relief valve from the fill cap to an internal component attached to the boiler tank. This change should eliminate water leaking from the fill cap. The Aqua had adequate steam capacity and worked especially well in smaller base dental laboratories. The **Aqua Steam Cleaner** is rated **Recommended** for use by the federal dental services in small- to medium-size (i.e., lower-volume) dental laboratories. The **Aqua Steam Cleaner** is rated **Acceptable** for use in large (i.e., higher-volume) dental laboratories.

(MSgt Osborn)

## 66-18 Pro Blend Mixer

(Project 02-03)

The Pro Blend is a power vacuum mixer designed to mix dental stone, investment, and alginate materials. It features two electric motors: a 600-RPM, 1/8-horsepower motor to provide power for the mixing blades; and a self-contained, oil-less motor that provides vacuum for removing air from the dental materials being mixed. Both motors are said to be protected from overheating by a thermal overload switch. The Pro Blend is advertised as allowing hands-free mixing by the use of a coupler on the unit that is activated by inserting and twisting the Pro Vac-U-Mixer bowl into the unit. A built-in electronic adjustable timer controls mixing times which have a five-second increment and defaults to the previous time setting with each use. Additionally, the Pro Blend is equipped with a sensing device that is said to allow the drive motor to activate only when vacuum is above 15 Hg and a Pro Vac-U-Mixer bowl is locked into place. The vacuum-sensing device is also reported to automatically start and stop in conjunction with the electronic timer's programmed time, while another switch releases vacuum once mixing is complete. As with previous Whip Mix mixing units, a built-in vibrator arm is present which activates by depressing it. The intensity of vibration is controlled by increasing or decreasing pressure to the arm. The unit's typical analog gauge displays vacuum from 0 to 30 Hg. The Pro Blend mixer comes with a wall-mount bracket, 500-mL Pro Vac-U-Mixer bowl, tube of lubriplate, package of gauze filters, vacuum hose with connections, and detachable power cord. It is 15" W x 9¾" H x 10¼" D and weighs 27 pounds. Accessories sold separately are the Pro Blend Benchtop Stand, Pro Vac-U-Mixer (300 mL, 500 mL, or 875 mL) and replacement bowls. The Pro Blend is available in 115V/60Hz or 230V/50Hz voltages.

**Manufacturer:**

Whip Mix Corporation  
361 Farmington Ave.  
P.O. Box 17183  
Louisville, KY 40217-0183  
800-626-5651  
502-637-1451  
502-634-4512 FAX  
www.whipmix.com

**Suggested Retail Price:**

\$1690.00 Pro Blend Mixer (item number 29150) complete with wall-mount bracket and 500 ml Pro Vac-U-Mixer

**Government Price:**

Pro Blend Mixer (contents and item number as above)

\$1284.60 Contiguous 48 States

\$1332.55 Alaska, Puerto Rico, Hawaii

**ADVANTAGES:**

- + Provides consistent, automatic, and hands-free mixing of dental laboratory materials.
- + Successfully mixed a wide range of materials during the laboratory evaluation.
- + Automatic mixing feature means users need not stand by machine for entire mixing time.
- + Operation of unit's controls is easy and intuitive.
- + Has a built-in adjustable timer.
- + Easy to operate.
- + Oil-less vacuum pump requires less maintenance.
- + Can be mounted either on the wall or the laboratory bench top.
- + Meets all electrical safety standards.
- + Manufacturer's instructions are complete and easy to understand.

**DISADVANTAGES:**

- Required additional steps are time consuming when materials with a 20-second or shorter mixing time are used.
- Does not have a timer for vacuum-only period after mixing; would be handy for some materials.

**SUMMARY AND CONCLUSIONS:**

The Pro Blend mixer is an automatic, hands-free vacuum mixer that can be wall-mounted or mounted on the bench top by using an optional stand. The unit is automatically controlled by a built-in timer and vacuum-sensing device that start and stop the mixing process. The adjustable timer defaults to the previous setting or may be changed in increments of five seconds up to a maximum of five minutes. A twist-latching device on the Pro-Vac-U-Mix bowls provides hands-free mixing, but clinical evaluators noted this feature required additional steps compared to current vacuum mixers in use. However, these additional steps were found by DIS laboratory testing to add only nine additional seconds to the mixing cycle. The Pro Blend's dual-motor design provided smooth dense mixes of all types of materials used during the evaluation. The hands-free feature was found to be especially useful when the mixing of materials requires more than 20 seconds. The **Pro Blend Mixer** is rated **Acceptable** for use by the federal dental services.

(MSgt Osborn)

# INFECTION CONTROL



## 66-19 DioxiClear

(Project 01-70)

DioxiClear is a chlorine dioxide-based dental unit waterline cleaner marketed for use in units that have a self-contained water system. The product consists of two separate liquid concentrates that are placed in a dental unit's self-contained reservoir and then mixed with tap water. The mixing activates the active ingredients (chlorine dioxide and chlorous acid). For ideal waterline cleaning, the manufacturer recommends that DioxiClear be used in two steps: a twice-monthly flush with high concentrate solution or three minutes, and daily use of low-concentration solution (for continuous use). DioxiClear is supplied in one-gallon sets, including a measuring beaker and graduated cylinder to facilitate proper mixing concentrations.

### **Manufacturer:**

Frontier Pharmaceutical, Inc.  
135 Spagnoli Road  
Melville, NY 11747  
(800) 767-3486  
(631) 777-1420  
(631) 777-1422 FAX  
www.frontierpharm.com

### **Suggested Retail Price:**

\$89.00 One-gallon set

### **Government Price:**

\$60.00 One-gallon set

### **ADVANTAGES:**

- + After treatment, dental unit water met American Dental Association (ADA) recommendations.
- + Easy to mix and use.
- + Protocol is simple to implement.
- + No clogging of waterlines noted.
- + No detrimental effects noted to the dental unit.
- + Minimal amount needed for daily application.
- + Easy to dispense using provided spigot, beaker, and graduated cylinder.
- + No after-taste noted when used continuously at the recommended concentration.

### **DISADVANTAGES:**

- More expensive than using diluted bleach for cleaning waterlines.
- Strong bleach smell when used for biweekly flush.
- Product requires mixing.

### **SUMMARY AND CONCLUSIONS:**

DioxiClear is a two-part, chlorine dioxide-based dental unit waterline cleaner. It was rated by DIS clinical users as Good or Excellent for its handling properties and clinical acceptability. During the eight-week test period, all tested water samples met the ADA goal for dental treatment water used for nonsurgical procedures. The product requires mixing two liquid concentrates with tap water in the dental unit's separate water bottle. Manufacturer instructions recommend a biweekly flush for three minutes using a high concentration solution, and a continuous daily use of a low-concentration solution. Patients did not complain of after-taste when the product was used continuously. The dental staff felt the product was easy to use and required minimal time to implement. Its relatively minor disadvantages were increased cost compared to using diluted bleach for waterline cleaning, a strong bleach smell when using the product for the biweekly flush, and the need for mixing before use. **DioxiClear** is rated **Acceptable** for use by the federal dental services.

(Col Bartoloni)

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## 66-20 Selective MicroClean

(Project 01-71)

Selective MicroClean is a chlorine dioxide-based dental unit waterline cleaner made for use in self-contained water systems. The manufacturer claims that the product eliminates odors, and removes mineral deposits and organic matter. The product uses a unique delivery system called micro-reactor technology to produce chlorine dioxide gas in solution. The cleaning solution is made using a semi-porous membrane pouch that contains a mixture of dry sodium chlorite and an activator. The pouch is heat-sealed inside a plastic bag with a screw-top lid. Tap water is poured into the bag via the screw-top lid. The water then surrounds the semi-porous pouch inside the bag and seeps inside the pouch. The solution is allowed to sit for 60 minutes for full activation before placement in the waterlines. This produces one liter of solution with a 50 parts-per-million (ppm) concentration of chlorine dioxide. The manufacturer recommends a two-step treatment protocol. For heavily contaminated systems, one liter of solution is pumped through the waterlines and allowed to remain overnight. This is accomplished for 3 consecutive workdays. Thereafter, one-third liter of solution is pumped through the waterlines and allowed to remain overnight. The manufacturer recommends this last step be accomplished biweekly for maintenance.

### Manufacturer:

Selective Micro Technologies  
66 Cherry Hill Drive  
Suite 230  
Beverly, MA 01915  
(978) 927-6610  
(978) 927-6088 FAX  
[www.selectivemicro.com](http://www.selectivemicro.com)

**Suggested Retail Price:** \$15.95

**Government Price:** Price pending

### ADVANTAGES:

- + After treatment, dental unit water met ADA recommendations.
- + Easy to mix, place, and use.
- + Simple protocol to follow requiring only biweekly use for maintenance.
- + No clogging of waterlines was noted.
- + No detrimental effects to the dental unit were noted.
- + Innovative packaging system.
- + Can be mixed with tap water.
- + No offensive odor or aftertaste detected.

### DISADVANTAGES:

- More expensive than using diluted bleach for cleaning waterlines.
- Product requires mixing.
- Product requires 60-minute activation time prior to use.

### SUMMARY AND CONCLUSIONS:

Selective MicroClean is a chlorine dioxide-based dental unit water line cleaner that is mixed within a proprietary delivery system. During the test period, all tested water samples met the ADA goal for output treatment water. The product requires placing tap water within the packaging system followed by a 60-minute activation time. Manufacturer instructions recommend an overnight application (one liter of solution) for three consecutive days for heavily contaminated systems and biweekly use (one-third liter) for maintenance. Users rated its handling properties and clinical acceptability as Good or Excellent. They also found the product easy to use and enjoyed the biweekly use time interval. The main shortcomings noted were its increased cost compared to diluted bleach, the need for mixing, and the need to wait 60-

minutes before using. **Selective MicroClean** is rated **Acceptable** for use by the federal dental services.  
(Col Bartoloni)